

Calculate Mean Deviation, Standard Deviation

Table

Graph

Simple Frequency Distribution

Distribution of 20 child according to weight (kg)

Complex Frequency Distribution

14,12,22,15,16,20,18,19,23,11,16,22,24,23,26,14,26,17,26,27,24,18

	weight (kg)	Frequency	Relative Frequency %	Cumulative Frequency
1	10 – 14	3	15	15
2	15 – 19	7	35	50
3	20 – 24	6	30	80
4	25 – 30	4	20	100
	Total	20	100	

	Lung Cancer				Total	
	Case		Control			
	N	%	N	%	N	%
Smoker	15	75	8	20	23	38.33
Non Smoker	5	25	32	80	37	61.67
Total	20	100	40	100	60	100

Frequency: Range عدد الأرقام التي توجد في

Relative Frequency %: $\frac{\text{Frequency}}{\text{Total}} \times 100$

Cumulative Frequency: جمع Relative Frequency مع ما قبلها

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Calculate Mean Deviation, Standard Deviation

x	$x - \bar{x}$	$(x - \bar{x})^2$
12	$12 - 9 = 3$	9
11	$11 - 9 = 2$	4
10	$10 - 9 = 1$	1
9	$9 - 9 = 0$	0
9	$9 - 9 = 0$	0
9	$9 - 9 = 0$	0
8	$8 - 9 = -1$	1
7	$7 - 9 = -2$	4
6	$6 - 9 = -3$	9

X : Number

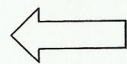
$\bar{x}$: Mean = $81 / 9 = 9$

Mean Deviation = Sum of $(x - \bar{x})^2 / 9 = 28 / 9 = 3.11$

Standard Deviation (SD) = $\sqrt{3.11} = 1.76$

Data

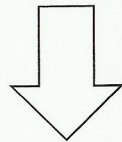
وصف بدون أرقام



Qualitative

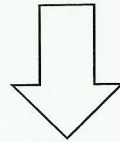
Quantitative

Nominal



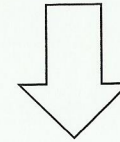
لها اسم
لا يوجد ترتيب
e.g: Blood
groups
(A,B,AB,O)

Ordinal



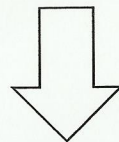
ليس لها اسم
لها ترتيب
e.g: severe
head injury
يمكن تصنيفها حسب
الحالة

Discrete



رقم بدون كسر
e.g: number of
Children (2-3)

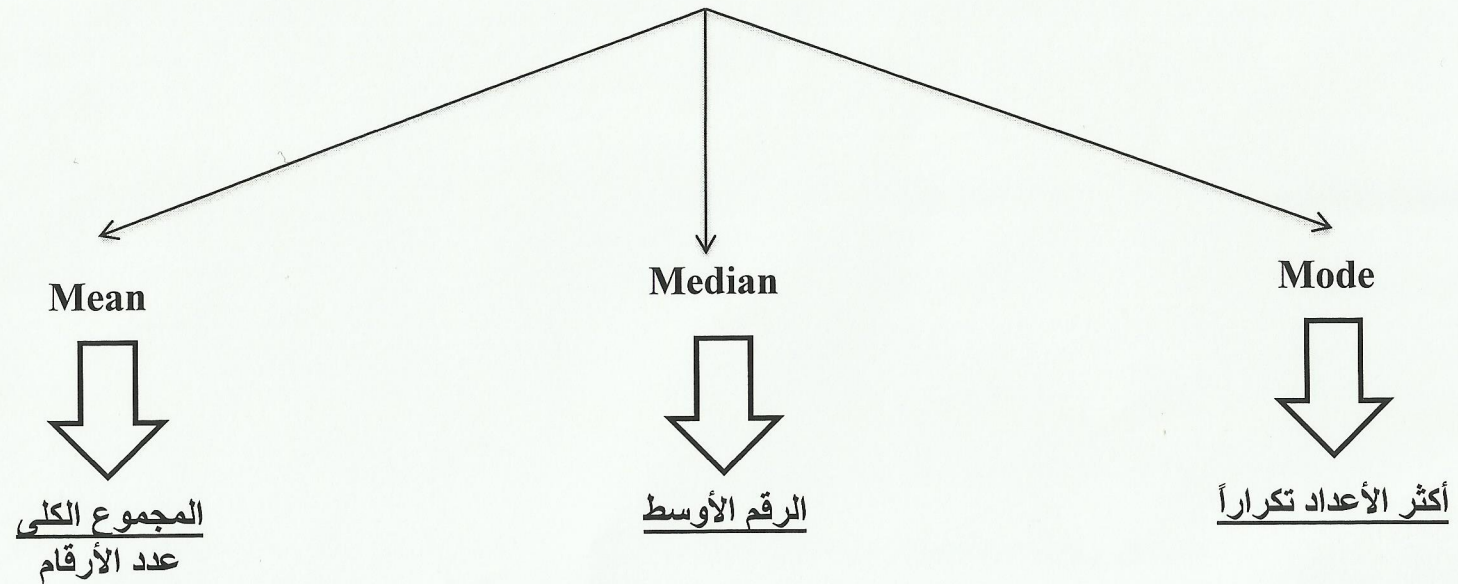
Continuous



رقم به كسر
e.g: weight
(58.5 kg)

Any Numerical Data (Age, Weight) is Quantitative

Central tendency (مجموعة أرقام يتم تمثيلها برقم واحد)



Advantage

- 1) أفضل مقياس
- 2) لا تحتاج لترتيب

- 1) Not affected by extreme values
- 2) Used for data

- 1) Not affected by extreme values
- 2) Nominal data (الأفضل)

Disadvantages values

- 1) Affected by extreme

ترتيب الأرقام
(Ascending or Descending)

N.B: 1) **Mode** is easily located by finding peak in Frequency Distribution graph

2) **Mode** may be > 1 e.g: 3, 4 , 5 , 6 , 4 , 6 (4 , 6)

Dispersion Measures

Range

Mean Deviation

Standard Deviation (SD)

Variance

(Most Common)

يساوى أكبر رقم - أصغر رقم

الخطوات

(١) إحسب Mean للأرقام

(٢) إطرح Mean $(\bar{x})$ من كل رقم (x)

(٣) إضرب ناتج طرح كل رقم فى نفسه

(٤) إجمع الناتج من الخطوة الثالثة

(٥) إحسب Mean للخطوة الرابعة

انظر مسألة الصفحة القادمة

$$\sqrt{\text{Mean Deviation}} = \text{SD}, \quad \sqrt{\text{SD}} = \text{Variance}$$

Central Tendency مسائل عن

Odd numbers

4, 5, 6, 4, 7

$$\text{Mean} = \frac{4 + 5 + 6 + 4 + 7}{5} = 5.2$$

$$\text{Median} = \frac{n + 1}{2} = \frac{5 + 1}{2} = 3$$

↓
Arrange numbers 1st (Ascending)

↓
1) 4

2) 4

3) 5 ←

4) 6

5) 7

Mode = 4.

Even numbers

4, 7, 5, 12, 6, 10

$$\text{Mean} = \frac{4 + 7 + 5 + 12 + 6 + 10}{6} = 7.3$$

$$\text{Median} = \frac{3^{\text{rd}} + 4^{\text{th}} \text{ number}}{2} = 6.58$$

↓
Arrange numbers 1st (Ascending)

↓
1) 4

2) 5

3) 6 ←

4) 7

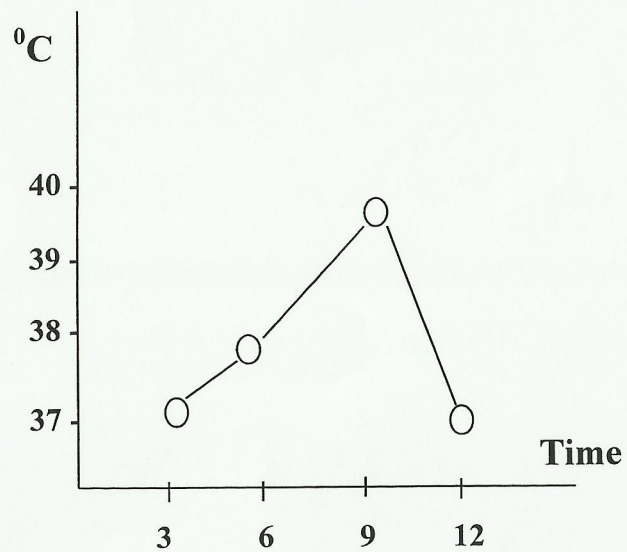
5) 10

6) 12

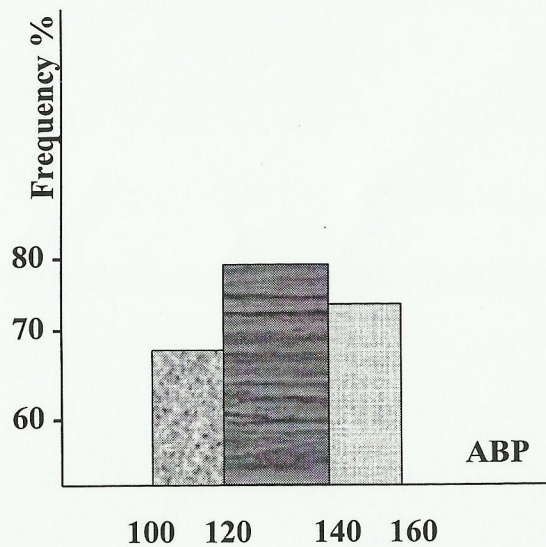
Mode (لا يوجد)

Graph

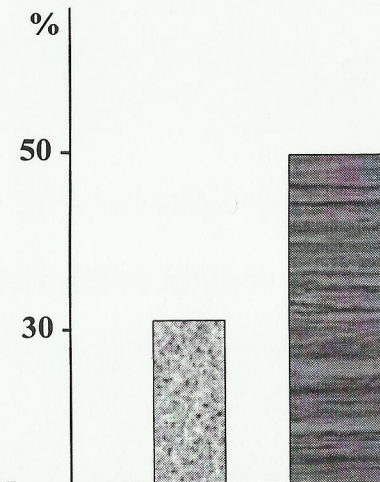
Line graph
(Temperature chart)



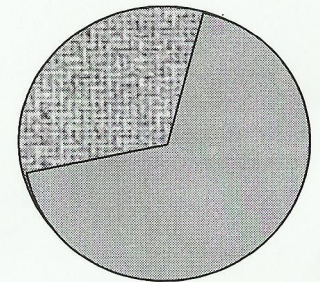
Histogram
(Continuous Variable)



Bar Chart



Pei Chart



Quantitative

Qualitative